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THE PLANT DISEASE REPORTER

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THE OFFICE OF MYCOLOGY AND DISEASE SURVEY

VOLUME XV **NUMBER 2**

MARCH 1, 1931

BUREAU OF

PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

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FRUIT DISEASES

NOTES ON BLUEBERRY DISEASES IN MAINE

by

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The "cultivated" blueberries of Maine consist of native species; chiefly Vaccinium pennsylvanicum Lam., with a fair representation of V. canadense Kahm., and with other species present. These are the "low-bush" blueberries growing on the "barrens" of Washington County. The "low-bush" blueberry is an important crop in the coastal regions of the State, and in York County in the southwestern corner, the "high-bush" blueberry, V. corymbosum L., is of considerable importance. At present, planted areas are small and few in number. Most of the fields consist of native plants which have spread into cleared woodlands and old farm lands. In fields of "low-bush" blueberries the rate of spread is hastened by the practice of burning over the plants about every third year. This burning serves as a pruning measure and also, it now appears, as a disease-control measure, and is the only form of cultivation practiced aside from some effort to control weeds. The surface of the ground in many fields is actually covered by blueberry plants. In any one field there may be many clones as different from one another as the cultivated varieties of V. corymbosum. Because there are many differences in the plants and in the soil and because no area is entirely free from diseases, no accurate estimate of crop losses can be made at present.

The following notes on diseases of Vaccinium and related plants are from observations made during the summers of 1929 and 1930.

COMMON DISEASES

WITCHES' BROOM (Calyptospora columnaris Kühn.). The disease is frequent on plants within several hundred yards of woodlands. It is sometimes serious in small areas partially surrounded by woods, practically a 100 per cent infection having been observed in one field on V. pennsylvanicum and V. corymbosum. Burning does not control the disease.

The Maine Agricultural Experiment Station in 1928 planted several varieties of V. corymbosum from Whitesbog, New Jersey, in a nursery at North Sedgwick. This nursery contains many other blueberry plants, mostly V. pennsylvanicum of native origin, is entirely surrounded by a field of native blueberries, and is about 50 feet from a wood lot. Witches' broom is said not to occur in New Jersey, and it is assumed that the plants from that source were free from infection when planted. In 1929, several had developed rust symptoms, and in 1930, forty of the seventy-one living Whitesbog plants set in 1928 and 1929 had brooms. The infected varieties include Adams, Cabot, Harding, Pioneer, Rubel, and Sam. Varieties Katherine and Rancocas have not developed symptoms, but were represented by only two plants each and may not be immune. Infection of other plants in the nursery amounted to only one per cent in about seven hundred. The high rate of infection of these Whitesbog plants is of considerable significance in view of the fact that improved varieties from outside sources are being considered for commercial plantings in the future.

Witches' broom has been observed on V. caespitosum Michx., V. canadense, V. corymbosum, V. pennsylvanicum, V. uliginosum L., and V. vitis-idaea L. V. uliginosum is listed as a new host. The aecial stage occurs on the current season's leaves of balsam fir, Abies balsamea (L.) Mill.

LEAF RUST (Pucciniastrum myrtilli Arth.). Leaf rust is general in distribution and occurs at least as far as a quarter of a mile from woodlands. The rust is sometimes abundant, but has been observed to sporulate and cause defoliation only in September and later, thus lessening the damage that might have occurred had it become more active earlier in the season.

Leaf rust has been observed on the blueberries V. canadense, V. corymbosum, V. pennsylvanicum, and V. uliginosum, and on Gaylussacia baccata (Wang.) C. Koch., and, in the aecial stage, on the hemlock, Tsuga canadensis (L) Carr.

RED LEAF SPOT (Exobasidium vaccinii Wor.) is widely distributed but has not been observed to be of such frequency on blueberries as to cause serious loss. It was more common in 1930 than in 1929. Infected leaves are very conspicuous in June and early July because of their brilliant red color. At about that time white masses of mycelium and spores are produced on the under surfaces of infected leaves. Soon after spore production infected plants are defoliated. Leaf infection, however, continues throughout the season. In addition to leaf infection, hypertrophy of blossoms, small fruits and twigs has been observed on the huckleberry, G. baccata. Burning apparently controls this disease to some extent.

Exobasidium has been observed on the following plants: V. canadense, V. corymbosum, V. pennsylvanicum, V. vitis-idaea, Andromeda glaucophylla Link, G. baccata, and Rhododendron canadense (L.) B.S.P. V. canadense and V. corymbosum are new hosts.

SCLEROTINIA TWIG-BLIGHT AND FRUIT-ROT. A serious monilial twig-blight occurred during May and early June in 1929, but was rarely observed in 1930. The difference in seasonal occurrence may be correlated with weather conditions in spring. These observations agree with those of workers on cranberry diseases who have noted that twig-blight occurred during cold, wet weather in May such as occurred in Maine in the spring of 1929. May and early June of 1930 were dry and warm.

The blight appeared first on leaves and progressed into the stems, frequently destroying them to the ground. The blight was so severe in 1929 that there were areas four or five feet in diameter in which all stems were destroyed. Sclerotial fruits were frequently observed during July but have not been noted to persist after ripening time as they do on cranberries.

The disease has been observed on V. canadense, V. corymbosum, and V. pennsylvanicum. Only the fruit-rot stage has been observed on V. macrocarpon Ait.

BOTRYTIS BLOSSOM-BLIGHT AND FRUIT-ROT. A Botrytis blossom-blight which was very common in 1930 appeared during a week of foggy, warm weather in late June. The fungus was very destructive on blossoms and small fruits, killing twig tips, leaves, and even stems. Infection appeared to commence in the corolla, from where it progressed downward through the point of attachment of the corolla into the fruit. Observations indicate that the disease may be correlated with poor pollination because the corolla of unpollinated blossoms persists, thus favoring the advancement of the fungus into the fruit. Botrytis sporulates on occasional shrunken berries during the summer. The blight has been observed on V. canadense, V. corymbosum, and V. pennsylvanicum.

MILDEW (Microsphaera alni, var. vaccinii (S.) Sal.). Mildew is of common occurrence and a cause of early defoliation. It is most severe on a black-fruited, waxy-leaved blueberry (V. pennsylvanicum var. nigrum) which is practically free from other diseases. V. corymbosum plants in York County were severely attacked but show very striking individual

differences in amount of infection. In addition to being seen on the above hosts, mildew has been observed on V. canadense, V. pennsylvanicum, and G. baccata.

ARSENICAL INJURY. Calcium arsenate dust is being used for blueberry maggot control. It was noticed that where a very heavy coating of the dust had been applied accidentally, severe burning of foliage resulted. The symptoms are marginal browning, and circular to irregular spots, some with concentric rings. Plants were defoliated and fruits shrunken at harvest time. Arsenical injury might be confused with leaf-spots of pathogenic origin but the former was found on all kinds of plants present, which would likely not have been the case had the injury been due to a pathogen.

SPECIAL NOTICE TO COLLABORATORS IN STRAWBERRY GROWING STATES

On page 15 is a map giving the results of a special survey for the dwarf disease of strawberries conducted by the Office of Horticultural Crops and Diseases during the summer of 1930. Special interest will of course attach to finding this disease on strawberries in the next few years in the states of Texas, Oklahoma, Kansas, Missouri, Illinois, Indiana, Ohio, or West Virginia. Collaborators in these states as well as in other strawberry-growing states are asked to take particular note of strawberry diseases in the United States during the coming season. The dwarf disease is illustrated and briefly described in Farmers Bul. 1458 (revision of July 1930) p. 6-8.

Collaborators in the northern strawberry-growing areas are reminded at this time of the work which was done in collaboration with Doctor Plakidas on the so-called gold leaf or yellows of strawberries found in northern states. See P.D.R. for 1929, pages 77 and 129.

SURVEY FOR DWARF DISEASE OF STRAWBERRIES

The accompanying map (figure 1) shows the result of a survey during the summer of 1930 for the dwarf disease of strawberries, caused by the nema (Aphelenchus fragariae, or a closely related form). The disease was already known to be abundant in the strawberry growing regions of Florida, Louisiana, and North Carolina. As the map shows, diseased plants were also found during 1930 in western Tennessee and northern Arkansas in commercial plantings of standard varieties of strawberries. It was found in south central Kentucky, the Norfolk region of Virginia, and the Eastern Shore (Virginia, Maryland, and Delaware) on plants brought into the region in the spring of 1930 or in experimental plantings. Strawberry growing areas in the following regions were visited but no dwarf disease was found: southeastern Tennessee (Chattanooga), southwestern Missouri (Ozark Section), southern Illinois (Anna district), western Kentucky (Paducah), southern Indiana (New Albany), southwestern Ohio (Cincinnati).

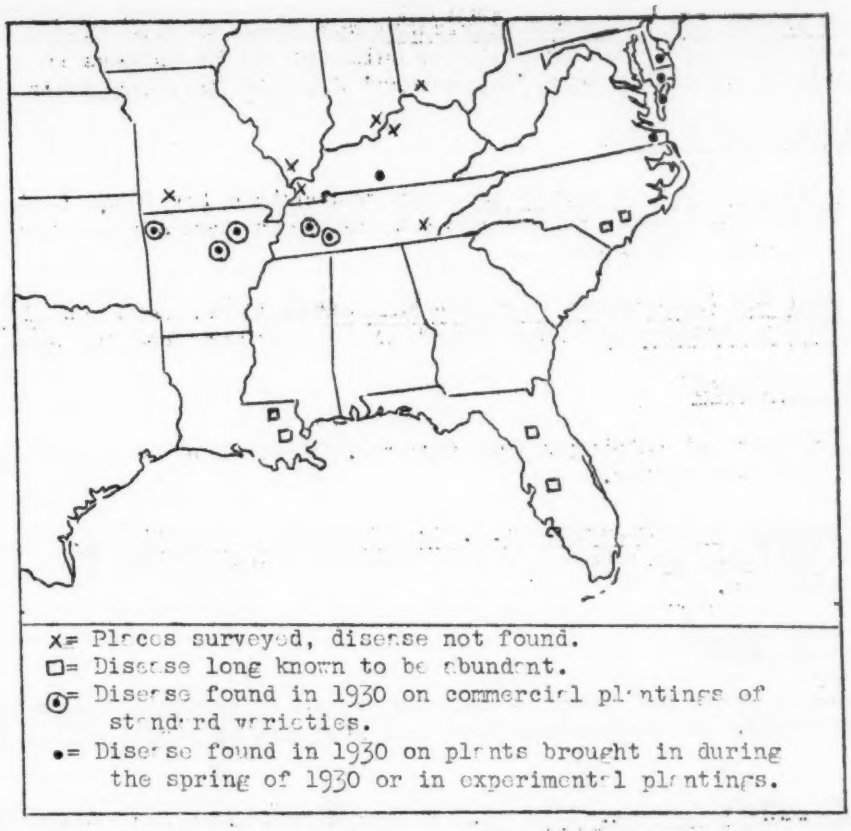
x= Places surveyed, disease not found.
□= Disease long known to be abundant.
⊙= Disease found in 1930 on commercial plantings of standard varieties.
•= Disease found in 1930 on plants brought in during the spring of 1930 or in experimental plantings.

Figure 1. Results of the 1930 survey for disease of strawberry dwarf.

The field work was done by Paul V. Mook. Identification of the nema which causes the dwarf disease was made by B. G. Chitwood.

NEW YORK MARKET PATHOLOGY NOTES

Cyril O. Bratley

STRAWBERRIES FROM FLORIDA

Although the strawberry sections of Florida received more than a normal amount of rain during January, the berries arriving on the New York Market in Early February were in excellent condition. Perhaps this is due in part to the prevailing low temperatures in Florida and in part to the shorter time of hauling provided by the recently initiated express refrigerator car service. In practically all express cars examined there was less than one per cent decay.

Rhizopus Rot (Rhizopus nigricans) was found to have caused about 5 per cent loss in crates against the bulkhead of the bunkers in a few cars. Apparently these crates were "hold-overs" from the previous day's picking.

CAULIFLOWER FROM ARIZONA

Gray Mold Rot (Botrytis sp.) was responsible for decay in 15 per cent of the cauliflower heads in two car-lot shipments from Arizona received in New York in early February.

Curd Rot (Alternaria brassicae) affected 30 per cent and Slimy Soft Rot (Bacillus carotovorus) 10 per cent in another car from the same district.

CANADIAN RUTABAGAS

Many cars of rutabagas from Ontario, Canada have been arriving in New York the past two months.

Fusarium Rot (Fusarium sp.), Gray Mold Rot (Botrytis sp.) and Slimy Soft Rot (Bacillus sp.) together have been the cause of from 7 to 10 per cent loss in all cars.

SPINACH FROM TEXAS

Many express car loads of spinach have been arriving in New York the past two months. This commodity has been arriving in especially good condition.

Slimy Soft Rot (Bacillus sp.) in occasional cars has caused the decay of 2 to 3 per cent of the load. In all cases this decay was found to be following bud worm injury.

RHODE ISLAND GREENING APPLES

Internal Browning. 50 per cent of the apples in two cars of Rhode Island Greenings from Vermont inspected in New York were found to contain internal browning. It has been quite uncommon to find this disease in this variety of apples. Several cars of the same variety of apples from both the Hudson Valley and from Western New York showed as high as 7 per cent internal browning.

Scald was present on a considerable percentage of the apples in the two shipments from Vermont.

MISCELLANEOUS NOTES

SCLEROTIUM ROLFSII IN NORTH CAROLINA

This fungus attracted the most interest during the summer of 1930 because of the greater destructiveness to many varieties of plants as compared to the slight losses that have occurred in other recent years. The fungus causes some damage every season. Soybeans are attacked every year and sometimes all plants are destroyed for ten feet or more in the row or in localized areas. Tomato fruits, cantaloupes, and even rye plants may show infection any season. But the past summer was extremely favorable for the development of the fungus, and it destroyed a great variety of plants including perennial and biennial ornamentals such as sweet william, the pinks, and carnations. It was so severe on tobacco that many farmers were alarmed and asked such questions as "Is it safe to plant tobacco again in the same fields and is there a practical control?" The disease was worst in areas where temperature and moisture conditions were very favorable for plant growth. During July and August rainfall was less and temperatures were higher than during the same two months of the two previous years. Short drought periods occurred during this time in areas where the disease was troublesome, but they were not sufficiently extended to greatly affect plant growth. (R. F. Poole)

LEAF DISEASE OF PALMS IN CALIFORNIA

A specimen of a leaf disease on the native palm Neowashingtonia filamentosa Sudw., received from Mr. Wm. Shear, County Agricultural Inspector at San Diego, California, was determined by Dr. C. L. Shear as due to Phaeochora neowashingtoniae (Shear) Theiss. & Syd. This fungus was apparently first found in southern California in 1907, and described by Dr. Shear as Sphaerodothis neowashingtoniae. (Shear, C. L. Sphaerodothis, a new genus of Dothidiaceous fungi. Mycologia 1: 161-163. 1909). It seems not to have been reported from other states.

The following note accompanied the specimen:

> "Upon interviewing some of our oldest nursery people in San Diego they report that some forty years ago when they came to this vicinity and planted some of these palms they found this fungus was infecting the leaves. These palms have been growing all this time without any apparent serious injury. They report that during this season of the year when it is cold and damp, the fungus increases until quite a number of the lower leaves turn yellow and eventually die, but after this weather has

passed and it becomes warm, the palms outgrow the trouble. However, some younger palms in other parts of the country are apparently not able to survive this infection, especially under climatic and soil conditions that are unfavorable. This nurseryman reports that out of some other half dozen species of this palm none of them are seriously affected with this disease. The reason this filamentosa variety is used is because it is able to endure lower temperatures than the other varieties and therefore is better adapted to certain localities in this country." (Wm. Shear, February 2)

PLANT QUARANTINE NOTES

H. S. Dean

Port interceptions:

Tylenchus dipsaci in leaves of Narcissus var. King Alfred from Canada (in express), intercepted (twice) at New York City, Feb. 3, 1931, by Messrs. Kostal and Dodd; and in leaves of vars. King Alfred, Golden Spur, and Victoria, also from Canada (in express), intercepted Feb. 4, 1931, by Messrs. Kostal and Dodd. Det.: Dr. G. Steiner.

Elsinoe canavaliae on Lima bean pod from La Cruz, Sinaloa, Mexico, (in cargo), intercepted at Nogales, Ariz., Jan. 29, 1931, by Mr. E. C. Harrison; and from San Blas, Sinaloa, Mexico (in cargo), intercepted at Nogales, Ariz., Feb. 7, 1931, by Mr. G. C. Martin. Det.: Mr. H. S. Dean.

III Uromyces alyxiae on Alyxia (myrtillifolia?) (Host det.: Mr. Davidson) from Hawaii (in ship's stores), intercepted at Seattle, Wash., Dec. 15, 1930, by Mr. M. J. Forsell. Det.: Mr. R. W. Davidson.

Discella strobilina on spruce cones from Poland (in mail), intercepted at New York City, Jan. 8, 1931, by Messrs. Taylor, Garrett, and Fitzgerald. Det.: Mr. G. H. Martin.

Gloeosporium palmarum on leaves of palm plants from Spain (in furnishings), intercepted at Philadelphia, Pa., Jan. 17, 1931, by Mr. J. A. Ramos. Det.: Mr. G. H. Martin.

Pseudomonas citri on orange peel from Japan (in ship's stores), intercepted at Seattle, Wash., Feb. 4, 1931, by Mr. C. V. Scott. Det.: Mr. H. R. Fulton.

Botryosphaeria ribis chromogena on Bowenia serrulata from Australia (in cargo), intercepted at Chicago, Ill., Dec. 23, 1930, by Mr. H. W. Hocker. Det.: Miss Wilcox.

Colletotrichum sp. on Myrobalan stock from France (in cargo), intercepted at New York City, Jan. 22, 1931, by Messrs. Mann and Inman. Det.: Mr. G. H. Martin.

Ascochyta sedi (= Diplodina sedi) on Bryophyllum from Bermuda (in baggage) intercepted at New York City, March 27, 1930, by Mr. A. B. Wells. Det.: Mr. G. H. Martin.

Phoma sp. on parsnip root from Sweden (in ship's stores), intercepted at Philadelphia, Pa., Jan. 29, 1931, by Mr. W. J. Ehinger. Det.: Mr. G. H. Martin.

II, III Puccinia obtecta on Tula grass (Scirpus sp.) used as packing material around plants from Chico, Calif., collected at Washington, D. C. Jan. 1, 1931, by Mr. D. P. Limber. Det.: Mr. R. W. Davidson.

Some specimens collected by inspectors in the vicinity of their respective stations:

Peridermium filamentosum on Pinus ponderosa from Santa Catalina Mts., Ariz., collected June 1, 1930, by Mr. R. F. Wilbur (Nogales). Det.: Mr. R. W. Davidson.

Sphaerella berberidis on Berberis nervosa from Lake Hancock, King Co., Wash., collected Nov. 8, 1930, by Mr. W. H. Wheeler (Seattle). Det.: Mr. G. H. Martin.

Coryneum sp. on Berberis nervosa from Ft. Lawton, Seattle, Wash., collected Jan. 28, 1931, by Mr. W. H. Wheeler (Seattle). Det.: Mr. G. H. Martin.